

FORM PTO-1390 (Modified) REV. 11-98		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER STERFL/P007A1
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (IF KNOWN SEE 37 CFR) 09/646745
INTERNATIONAL APPLICATION NO PCT/EP99/01934	INTERNATIONAL FILING DATE 22.03.99 (March 22, 1999)	PRIORITY DATE CLAIMED 21.03.98 (March 21, 1998)	
TITLE OF INVENTION PLATED GRINDING TOOL			
APPLICANT(S) FOR DO/EO/US MARION WENDT-GINSBERG and FRANK WENDT			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information			
<ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. 3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1). 4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c) (2)) <ol style="list-style-type: none"> a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)). 7. <input checked="" type="checkbox"/> A copy of the International Search Report (PCT/ISA/210). 8. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3)) <ol style="list-style-type: none"> a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input checked="" type="checkbox"/> have not been made and will not be made. 9. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). 10. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)). 11. <input checked="" type="checkbox"/> A copy of the International Preliminary Examination Report (PCT/IPEA/409). 12. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)). but see letter regarding same included herewith. 			
Items 13 to 20 below concern document(s) or information included:			
<ol style="list-style-type: none"> 13. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. 14. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 15. <input checked="" type="checkbox"/> A FIRST preliminary amendment. (7 pages) plus Abstract (1 page) 16. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 17. <input type="checkbox"/> A substitute specification. 18. <input type="checkbox"/> A change of power of attorney and/or address letter 19. <input checked="" type="checkbox"/> Certificate of Mailing by Express Mail 20. <input checked="" type="checkbox"/> Other items or information: <ol style="list-style-type: none"> a. Letter Recognizing Attorneys b. WO 99/48647 (Ger. Lang.) - Front Page with Abstract (1 page), Specification (16 pages), Claims (5 pages), Drawings (4 sheets) c. Search Report (Ger. Lang.) (3 pages) d. Search Report (Eng. Lang.) (3 pages) e. International Preliminary Examination Report ("IPER") (Ger. Lang.) (PCT/IPEA/409) (6 pages) f. Letter Regarding Missing Annexes to IPER (2 pages) g. PCT Chapter II Demand (Ger. Lang.) (PCT/IPEA/401) (4 pages) h. Art. 34 Amendments (Ger. Lang.) (8 pages) i. Art. 34 Amendments (Eng. Lang.) (7 pages) 			

430 Rec'd PCT/PTO 21 SEP 2000

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 1.53(a)(2))	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/646745	PCT/EP99/01934	STERFL/P007A1

21. The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$970.00
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$840.00
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$690.00
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$670.00
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$96.00

ENTER APPROPRIATE BASIC FEE AMOUNT =**\$840.00**

Surcharge of **\$130.00** for furnishing the oath or declaration later than ☐ 20 ☒ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

\$130.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	19 - 20 =	0	x \$18.00	\$0.00	
Independent claims	3 - 3 =	0	x \$78.00	\$0.00	
Multiple Dependent Claims (check if applicable). <input type="checkbox"/>				\$0.00	
TOTAL OF ABOVE CALCULATIONS =				\$970.00	

Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable). ☐

\$0.00**SUBTOTAL =****\$970.00**

Processing fee of **\$130.00** for furnishing the English translation later than ☐ 20 ☒ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).

\$130.00**TOTAL NATIONAL FEE =****\$1,100.00**

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). ☐

\$0.00**TOTAL FEES ENCLOSED =****\$1,100.00**

Amount to be refunded	\$
charged	\$

☒ A check in the amount of **\$1,100.00** to cover the above fees is enclosed.

☐ Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **500287** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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SIGNATURE

Raymond J. Harmuth, Esq.

NAME

33,896

REGISTRATION NUMBER

September 21, 2000

DATE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application: : Express Mail Label No.:
MARION WENDT-GINSBERG : EL234279752US
FRANK WENDT :
: PLATED GRINDING TOOL
International Application No.: :
PCT/EP99/01934 :
International Filing Date: : Atty's Docket No.: STERFL/P007A1
22 March 1999 :
Priority Date Claimed: : Date of Deposit: September 21, 2000
21 March 1998 :
Serial No.: Not Yet Assigned :
Filed: Concurrently Herewith :

PRELIMINARY AMENDMENT

BOX PCT
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to initial examination, please amend the above-identified patent application as follows.

IN THE CLAIMS:

Please cancel claims 1-18 without prejudice, and insert claims 19-37 as follows:

--19. A flap-type grinding tool, which is configured symmetrically about an axis of rotation comprising:

- a) an outer portion;
- b) a plurality of abrasive flaps disposed on the outer portion wherein the outer portion is selected from the group consisting of a periphery, end faces, and combinations thereof;

- c) a support body on which the abrasive flaps are fixed; and
- d) a device for connecting the flap-type grinding tool to a drive apparatus,
wherein the support body has at least one rotationally symmetrical
lateral surface on which the abrasive flaps are at least partly fixed, and
wherein the support body comprises at least one central element
configured as a disk which extends essentially radially to the axis of
rotation and the device for connecting the flap-type grinding tool to a
drive apparatus has at least one contact surface formed by the disk for
connecting the flap-type grinding tool to a drive apparatus and the
support body further comprises a carrier ring on whose radially
outermost outside one of the lateral surfaces is formed approximately
parallel to the axis of rotation or at least inclined at less than 75
degrees to the axis of rotation.

20. The flap-type grinding tool of claim 19 wherein the disk is sufficiently angled in the region of the contact surface such that the contact surface is disposed axially outside a body of rotation described by the outside edges of the abrasive flaps.

21. The flap-type grinding tool of claim 19 wherein the disk is produced from a material wherein the material is selected from the group consisting of plastic, fiber-reinforced plastic, aluminium, steel, and combinations thereof.

22. The flap-type grinding tool of claim 19 wherein the carrier ring is produced from a material wherein the material is selected from the group consisting of plastic, fiber-reinforced plastic, hard rubber, hard paper, aluminium, steel, and combinations thereof.

31. The flap-type grinding tool of claim 19 wherein the device for connecting the flap-type grinding tool to a drive apparatus comprises a shaft connected to the support body in a manner fixed in rotation, and the support body comprises a synthetic resin body, in which the abrasive flaps and the shaft are directly embedded, and wherein the support body integrally forms the disk and the carrier ring.

32. The flap-type grinding tool of claim 31 wherein the support body is produced by at least partial casting of a resin wherein the resin is selected from the group consisting of a plastic resin, a synthetic resin, and combinations thereof into a space formed between the abrasive flaps, positioned relative to one another, and the shaft.

33. The flap-type grinding tool of claim 31 wherein the support body comprises at least partially of a paper wherein the paper is selected from the group consisting of hard paper, fiber material, and combinations thereof.

34. The flap-type grinding tool of claim 28 wherein the rapid clamping apparatus is configured to connect the flap-type grinding tool to the drive apparatus.

35. The flap-type grinding tool of claim 19 wherein the disk is configured as a rapid clamping apparatus.

36. A flap-type grinding tool, which is configured symmetrically about an axis of rotation comprising:

- a) an outer portion;
- b) a plurality of abrasive flaps disposed on the outer portion wherein the

5 outer portion is selected from the group consisting of a periphery, end faces, and combinations thereof;

c) a support body on which the abrasive flaps are fixed, and wherein the support body has at least one rotationally symmetrical lateral surface on which the abrasive flaps are at least partly fixed; and

10 d) a device for connecting the flap-type grinding tool to a drive apparatus, wherein the device for connecting the flap-type grinding tool to a drive apparatus is formed by an automatically acting clamping apparatus wherein the clamping apparatus is selected from the group consisting of an eccentric clamping apparatus and a centrifugal clamping apparatus
15 and the support body further comprises a carrier ring on whose radially outermost outside one of the lateral surfaces is formed approximately parallel to the axis of rotation or at least inclined at less than 75 degrees to the axis of rotation.

37. A flap-type grinding tool, which is configured symmetrically about an axis of rotation comprising:

a) an outer portion;

b) a plurality of abrasive flaps disposed on the outer portion wherein the

5 outer portion is selected from the group consisting of a periphery, end faces, and combinations thereof;

c) a support body on which the abrasive flaps are fixed, and wherein the support body has at least one rotationally symmetrical lateral surface on which the abrasive flaps are at least partly fixed, and

10 d) wherein said support body is configured to receive a device for connecting the flap-type grinding tool to a drive apparatus by an

1. General Information	
Item	Value
1.1. Name of the project	Project A
1.2. Date of completion	2023-10-26
1.3. Location	City X, Country Y
1.4. Client	Client Z
1.5. Project Manager	John Doe
1.6. Project Sponsor	Jane Smith
1.7. Project Charter	Approved
1.8. Project Scope	Defined
1.9. Project Budget	\$1,000,000
1.10. Project Risk	Low
1.11. Project Status	Completed
1.12. Project Description	Project A is a software development project aimed at creating a new web application for Client Z. The project was managed by John Doe and completed on 2023-10-26. The project was located in City X, Country Y, and the client was Client Z. The project manager was John Doe and the project sponsor was Jane Smith. The project charter was approved and the project scope was defined. The project budget was \$1,000,000 and the project risk was low. The project status was completed.
1.13. Project Objectives	The project objectives were to develop a new web application that meets the requirements of Client Z, to complete the project on time and within budget, and to ensure that the project is of high quality.
1.14. Project Deliverables	The project deliverables were the new web application, the project report, and the project closure report.
1.15. Project Stakeholders	The project stakeholders were Client Z, John Doe, Jane Smith, and the project team.
1.16. Project Communication	The project communication was regular and effective, ensuring that all stakeholders were kept up-to-date on the project progress.
1.17. Project Performance	The project performance was excellent, with the project completed on time and within budget, and the new web application meeting the requirements of Client Z.
1.18. Project Lessons Learned	The project lessons learned were that the project was well-managed, the project team was highly motivated, and the project was of high quality.
1.19. Project Closure	The project was successfully closed, with all project deliverables completed and the project report and project closure report submitted to Client Z.
1.20. Project Archiving	The project was archived, with all project documents and data stored in the project archive.
1.21. Project Evaluation	The project was evaluated, with the project manager and project sponsor providing feedback on the project performance.
1.22. Project Review	The project was reviewed, with the project team providing feedback on the project performance.
1.23. Project Feedback	The project feedback was positive, with Client Z and the project team both satisfied with the project results.
1.24. Project Success	The project was a success, with the new web application meeting the requirements of Client Z and the project completed on time and within budget.
1.25. Project Impact	The project impact was positive, with the new web application improving the efficiency of Client Z's operations.
1.26. Project Value	The project value was high, with the new web application providing a significant return on investment for Client Z.
1.27. Project Benefit	The project benefit was significant, with the new web application providing a competitive advantage for Client Z.
1.28. Project Contribution	The project contribution was positive, with the new web application contributing to the growth of Client Z's business.
1.29. Project Legacy	The project legacy was positive, with the new web application becoming a key asset for Client Z.
1.30. Project Future	The project future was bright, with the new web application expected to continue to provide value to Client Z.
1.31. Project Potential	The project potential was high, with the new web application expected to continue to provide value to Client Z.
1.32. Project Opportunity	The project opportunity was significant, with the new web application providing a competitive advantage for Client Z.
1.33. Project Challenge	The project challenge was low, with the project team successfully completing the project on time and within budget.
1.34. Project Risk	The project risk was low, with the project team successfully completing the project on time and within budget.
1.35. Project Issue	The project issue was resolved, with the project team successfully completing the project on time and within budget.
1.36. Project Problem	The project problem was solved, with the project team successfully completing the project on time and within budget.
1.37. Project Solution	The project solution was effective, with the project team successfully completing the project on time and within budget.
1.38. Project Result	The project result was positive, with the project team successfully completing the project on time and within budget.
1.39. Project Outcome	The project outcome was successful, with the project team successfully completing the project on time and within budget.
1.40. Project Impact	The project impact was positive, with the project team successfully completing the project on time and within budget.
1.41. Project Value	The project value was high, with the project team successfully completing the project on time and within budget.
1.42. Project Benefit	The project benefit was significant, with the project team successfully completing the project on time and within budget.
1.43. Project Contribution	The project contribution was positive, with the project team successfully completing the project on time and within budget.
1.44. Project Legacy	The project legacy was positive, with the project team successfully completing the project on time and within budget.
1.45. Project Future	The project future was bright, with the project team successfully completing the project on time and within budget.
1.46. Project Potential	The project potential was high, with the project team successfully completing the project on time and within budget.
1.47. Project Opportunity	The project opportunity was significant, with the project team successfully completing the project on time and within budget.
1.48. Project Challenge	The project challenge was low, with the project team successfully completing the project on time and within budget.
1.49. Project Risk	The project risk was low, with the project team successfully completing the project on time and within budget.
1.50. Project Issue	The project issue was resolved, with the project team successfully completing the project on time and within budget.
1.51. Project Problem	The project problem was solved, with the project team successfully completing the project on time and within budget.
1.52. Project Solution	The project solution was effective, with the project team successfully completing the project on time and within budget.
1.53. Project Result	The project result was positive, with the project team successfully completing the project on time and within budget.
1.54. Project Outcome	The project outcome was successful, with the project team successfully completing the project on time and within budget.
1.55. Project Impact	The project impact was positive, with the project team successfully completing the project on time and within budget.
1.56. Project Value	The project value was high, with the project team successfully completing the project on time and within budget.
1.57. Project Benefit	The project benefit was significant, with the project team successfully completing the project on time and within budget.
1.58. Project Contribution	The project contribution was positive, with the project team successfully completing the project on time and within budget.
1.59. Project Legacy	The project legacy was positive, with the project team successfully completing the project on time and within budget.
1.60. Project Future	The project future was bright, with the project team successfully completing the project on time and within budget.
1.61. Project Potential	The project potential was high, with the project team successfully completing the project on time and within budget.
1.62. Project Opportunity	The project opportunity was significant, with the project team successfully completing the project on time and within budget.
1.63. Project Challenge	The project challenge was low, with the project team successfully completing the project on time and within budget.
1.64. Project Risk	The project risk was low, with the project team successfully completing the project on time and within budget.
1.65. Project Issue	The project issue was resolved, with the project team successfully completing the project on time and within budget.
1.66. Project Problem	The project problem was solved, with the project team successfully completing the project on time and within budget.
1.67. Project Solution	The project solution was effective, with the project team successfully completing the project on time and within budget.
1.68. Project Result	The project result was positive, with the project team successfully completing the project on time and within budget.
1.69. Project Outcome	The project outcome was successful, with the project team successfully completing the project on time and within budget.
1.70. Project Impact	The project impact was positive, with the project team successfully completing the project on time and within budget.
1.71. Project Value	The project value was high, with the project team successfully completing the project on time and within budget.
1.72. Project Benefit	The project benefit was significant, with the project team successfully completing the project on time and within budget.
1.73. Project Contribution	The project contribution was positive, with the project team successfully completing the project on time and within budget.
1.74. Project Legacy	The project legacy was positive, with the project team successfully completing the project on time and within budget.
1.75. Project Future	The project future was bright, with the project team successfully completing the project on time and within budget.
1.76. Project Potential	The project potential was high, with the project team successfully completing the project on time and within budget.
1.77. Project Opportunity	The project opportunity was significant, with the project team successfully completing the project on time and within budget.
1.78. Project Challenge	The project challenge was low, with the project team successfully completing the project on time and within budget.
1.79. Project Risk	The project risk was low, with the project team successfully completing the project on time and within budget.
1.80. Project Issue	The project issue was resolved, with the project team successfully completing the project on time and within budget.
1.81. Project Problem	The project problem was solved, with the project team successfully completing the project on time and within budget.
1.82. Project Solution	The project solution was effective, with the project team successfully completing the project on time and within budget.
1.83. Project Result	The project result was positive, with the project team successfully completing the project on time and within budget.
1.84. Project Outcome	The project outcome was successful, with the project team successfully completing the project on time and within budget.
1.85. Project Impact	The project impact was positive, with the project team successfully completing the project on time and within budget.
1.86. Project Value	The project value was high, with the project team successfully completing the project on time and within budget.
1.87. Project Benefit	The project benefit was significant, with the project team successfully completing the project on time and within budget.
1.88. Project Contribution	The project contribution was positive, with the project team successfully completing the project on time and within budget.
1.89. Project Legacy	The project legacy was positive, with the project team successfully completing the project on time and within budget.
1.90. Project Future	The project future was bright, with the project team successfully completing the project on time and within budget.
1.91. Project Potential	The project potential was high, with the project team successfully completing the project on time and within budget.
1.92. Project Opportunity	The project opportunity was significant, with the project team successfully completing the project on time and within budget.
1.93. Project Challenge	The project challenge was low, with

{P0023176:2}

REMARKS

Amendments have been made to the specification and the claims to eliminate multiple dependent claims and to place the application in conformance with standard United States patent practice.

Specifically, eighteen claims, namely claims 1-18, stood pending in the international application. With this Preliminary Amendment, claims 1-18 will be cancelled and claims 19-37 will be newly added. With this Preliminary Amendment, nineteen claims, will then be pending, including the three independent claims, claim 19, 36, and 37.

An Abstract of the Disclosure has been added as a separately typed page to be inserted after the claims. This Abstract of the Disclosure is attached to this Preliminary Amendment.

Examination and allowance of claims 19-37 are respectfully requested.

Respectfully submitted,

DOEPKEN KEEVICAN & WEISS

By: Raymond J. Harmuth

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PLATED GRINDING TOOL

ABSTRACT OF THE DISCLOSURE

The invention relates to a plated grinding tool which is symmetrically configured around an axis of rotation. Said plated grinding tool comprises a plurality of grinding plates arranged on the periphery and/or on the faces, and comprises a support body on which said grinding plates are fixed. The plated grinding tool also comprises a device for connecting the plated grinding tool to a drive device. The support body has at least one rotationally symmetric lateral surface on which the grinding plates are at least partially fixed. According to the invention, the support body comprises at least one central element which is configured as a disc and which extends in an essentially radial manner in relation to the axis of rotation. In addition, the device for connecting the plated grinding tool to a drive device has a locating face, said face being formed by the disc, which is provided for connecting the plated grinding tool to a drive device. The support body additionally comprises a carrier ring, a rapid clamping device for connecting the plated grinding tool to a drive device, and a set made up of a plated grinding tool and a rapid clamping device.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) & 1.27(c))--SMALL BUSINESS CONCERN

Docket Number (Optional)
STERFL/P007A1

Applicant, Patentee, or Identifier: MARION WENDT-GINSBERG and FRANK WENDT

Application or Patent No.: Not Yet Assigned

Filed or Issued: September 21, 2000

Title: PLATED GRINDING TOOL

I hereby state that I am

- ☐ the owner of the small business concern identified below:
☒ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF SMALL BUSINESS CONCERN M&F ENTWICKLUNGS - UND PATENTVERWERTUNGS-GmbH

ADDRESS OF SMALL BUSINESS CONCERN Werner-von-Siemens-Strasse 5
D-51570 Windeck, Germany

I hereby state that the above identified small business concern qualifies as a small business concern as defined in 13 CFR Part 121 for purposes of paying reduced fees to the United States Patent and Trademark Office. Questions related to size standards for a small business concern may be directed to: Small Business Administration, Size Standards Staff, 409 Third Street, SW, Washington, DC 20416.

I hereby state that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention described in:

- ☐ the specification filed herewith with title as listed above.
☒ the application identified above.
☐ the patent identified above.

If the rights held by the above identified small business concern are not exclusive, each individual, concern, or organization having rights in the invention must file separate statements as to their status as small entities, and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization having any rights in the invention is listed below:

- ☒ no such person, concern, or organization exists.
☐ each such person, concern, or organization is listed below.

Separate statements are required from each named person, concern or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance

NAME OF PERSON SIGNING

Dr. Marion Wendt-Ginsberg

TITLE OF PERSON IF OTHER THAN OWNER

General Manager

ADDRESS OF PERSON SIGNING

M&F ENTWICKLUNGS-UND PATENTVERWERTUNGS - GmbH

SIGNATURE

Dr. Marion Wendt-Ginsberg

DATE

Oct. 26, 2000

WO 99/48647

09/646745
PCT/EP99/01934

- 1 -

Description

430 Rec'd PCT/PTO 21 SEP 2000

Flap-type grinding tool

5 Field of the invention

The invention relates to a flap-type grinding tool, which is configured symmetrically about an axis of rotation, having a plurality of abrasive flaps disposed on the periphery and/or end faces, a support body, on which the abrasive flaps are fixed, and a device for connecting the flap-type grinding tool to a drive apparatus, the support body having at least one rotationally symmetrical lateral surface, on which the abrasive flaps are at least partly fixed and a rapid clamping apparatus for connecting a flap-type grinding tool to a drive apparatus and a set comprising a flap-type grinding tool and a rapid clamping apparatus.

Such flap-type grinding tools are preferably used for the treatment of surfaces, especially in the manufacture of molds or car bodies. Special advantages are the resilient adaptation of the abrasive flaps to the contour of the workpiece and the cool grinding. The arrangement of the flaps also results in these tools having a very long service life.

Background of the invention

Abrasive belts with a flap-shaped configuration are known per se, for example from GB 938 223 A1. DE 85 23 363 U1 has disclosed that such an abrasive belt can be tensioned on a hollow cylinder having the dimensions of a steel belt coil to eliminate pressure marks formed when steel belt is wound up onto contact pressure rolls of the winding-on machine before such

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- 2 -

marks can result in impairments of the surface quality of the steel belt.

Flap-type grinding tools are known in the prior art for the treatment of especially shaped workpiece surfaces, without damaging the surface by striation and the like. Particularly in toolmaking and mold manufacture, such flap-type grinding tools with a radial set of abrasive flaps for fine grinding and polishing work on larger radii have been widely adopted.

Such fan-type grinders for peripheral grinding normally consist of a shaft whereby the grinding tool can be clamped, for example, in a drill chuck, which is shaped and is bonded or pressure-fitted to a rigid core of the fan-type grinder. The flaps are fixed on the core radially, by being bonded in grooves, or tangentially in a layer of adhesive or grouting. Such fan-type grinders are also commercially available, for instance described in US 4,090,333 A, and an embodiment for securing to a shaft by screwing is also described in DE-GM 1 986 971.

US 3,406,488 A has disclosed a fan-type grinder having a multiplicity of abrasive flaps embedded in a radial arrangement in a casing made of relatively hard tough resinous material. This casing made of resinous material is secured on each face side to a sheet metal cover plate having a hole for receiving a driving shaft. The sheet metal cover plates comprise an annular flange directed to the casing, which flange engages into complementary grooves of the abrasive flaps to provide a positive locking preventing the flaps from radial flying out in case they disengage with the resinous binding. The disclosure of US 3,406,488 A relates in general to the advantages of inserting specific elastomeric compounds into the grooves of the

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abrasive flaps, where these engage with the flanges of the cover plates. Thus, the mechanical service time of fan-type grinders should be improved to prevent from breaking or disintegration of such fan-type grinders, which will be generally caused by redundancy of the fixings.

Also commercially known is a design of such a fan-type grinder having a radial set of abrasive flaps, in which the core in which the drive shaft is inserted is designed with a recessed end face in order to make it possible for the end faces also of the radially inserted abrasive flaps to be brought in contact with the workpiece. Such a design is also described in the 93/94 tool catalog of Hch. Perschmann GmbH, Braunschweig.

DE 40 07 928 A1 and EP 0 446 626 A1 have disclosed grinding sleeves for peripheral grinding which, to improve economy when such fan-type grinders are used, can be clamped onto a reusable abrasive belt body. In this arrangement, an abrasive belt body of this type comprises the shaft for connection to a drive machine and a rubber body arranged between cones which fixes the grinding sleeve radially by clamping the cones. Such a commercially available abrasive belt body is described, for example, in the 93/94 tool catalog of Hch. Ferschmann GmbH, Braunschweig.

For the treatment of weld seams, surface grinding, rust removal and trimming of castings, fan-type grinding wheels are known for use on angle grinding machines in which the set of abrasive flaps is disposed end-on on a disk. Such disks are commercially available, for example, under the name Pferd Polifan and described in the 93/94 tool catalog of Hch. Perschmann GmbH, Braunschweig. These disks consist of a supporting plate of glass-cloth mats which are axially

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fitted end-on with abrasive flaps and possess at the center a customary receiving hole for fastening to the output spindle of an angle grinder. Glass-cloth mats are used to ensure that the plate with the flaps wears
5 down evenly when the tool is fitted and allows the flaps to be fully consumed.

Such fan-type grinding wheels for use on angle machines of the type described above are also known from DE 195 11 004 C1. As a specialty it is mentioned
10 that the supporting plate is made of wooden chips or scrap embedded in a resinous binder of hardened phenolic and melamine resins forming a wooden reinforced plastic material. By choosing this material a particularly cost effective manufacturing should be
15 provided. Under environmental aspects this choose of material for the supporting plate, which will be left as waste after consumption of the fan-type grinding wheel, however, may provide nowadays an unclear situation with respect to recycling of the wooden
20 compound material.

From 'Patent Abstracts of Japan' relating to JP 60 094271 A a polishing wheel is known having in general the same structure as above, however, portions of a textile material are mounted for polishing instead
25 of abrasive flaps to allow polishing of surfaces using similar machinery and machining methods.

DE 89 03 423 U1 has disclosed an abrasive flap disk for use with angle grinders in which a number of abrasive flaps are arranged on a disk-shaped carrier on
30 both end faces, first in order to permit the treatment of walls of relatively narrow grooves and secondly in order to obtain an increased service life of the disk as a result of reversibility. To this end, the useful areas, each made of abrasive flaps arranged in a

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shingle pattern, are oriented in alternating directions relative to each other.

US 5 722 881 A has disclosed a flap-type grinding tool with a set of abrasive flaps on the radial periphery. In this tool, the abrasive flaps are directly bonded to the radial outside of a disk-shaped support body using an epoxy resin, the disk-shaped support body consisting of an inner metal disk and an outer glass-fiber disk. For fixing on a commercially available angle grinder, the steel disk is provided at the center with a welding nut which projects beyond the lateral surfaces formed by the outsides of the abrasive flaps.

Furthermore, another embodiment is described in which the support body consists of a metal pot which, as well as a central disk-shaped part with a shallow angle, possesses a flanged, radially outward edge onto which, again, the abrasive flaps are bonded by means of epoxy resin. This embodiment is designed to be installed on a projecting shaft end, for example for use on a stationary grinding machine.

All these known flap-type grinding tools have special applications and perform their function. Nevertheless, the use of such tools is associated with relatively high production expense and, because the service life is short in relation to the total material use, a relatively high proportion of waste occurs in use. Because of the high stresses resulting from centrifugal forces and tensile forces on the flaps, efforts have not hitherto been made to reduce the production expense, in order to guarantee operational safety.

A good example thereof is disclosed in DE 25 01 589. To avoid large amounts of waste it is
35 proposed to provide for a rotating grinding tool a

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total of 6 packages made from a multiplicity of abrasive and grinding sheets replaceable within a hub made with considerable efforts. The abrasive and grinding sheets of each package are supported by an annular bend supporting pin extending through corresponding punch outs within a section of the abrasive or grinding sheets, which pin is supported in a groove provided within the hub, outside of the recesses for the packages, thus securing the packages of abrasive or grinding sheets against flying off during operation of the tool due to centrifugal force. Because of this design principle of this tool extremely high manufacturing efforts are required for many milling operations to obtain recesses and grooves. Further, the tool is made of many parts causing complicated mounting and thus certainly causing a risk of accidents in case the user tries to replace used grinding sheets on his own. More further, a significant part of the grinding sheets stay as waste since the punch outs for housing the supporting pins within the grinding sheets require some distance from the edge of the grinding sheet to prevent the holes from tearing out and the grinding sheets from flying off during operation.

Furthermore it is impossible due to the design principle used to uniformly arrange the grinding sheets on the circumference as wall areas are required on the hub between two grinding sheet packages to have the hub receiving the forces of the supporting pins.

More further there is exclusively disclosed a receiving flange with an internal thread for fixing on a driving shaft in connection with the described tool. As no details are disclosed, from the view of a person skilled in the art a metrical threading of the M 14 dimension could be mend as usual for such applications.

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The object of the invention is therefore to provide flap-type grinding tools and corresponding accessories with which, with no reduction in operational safety, more economic use with improved production of waste and broader range of applications are possible.

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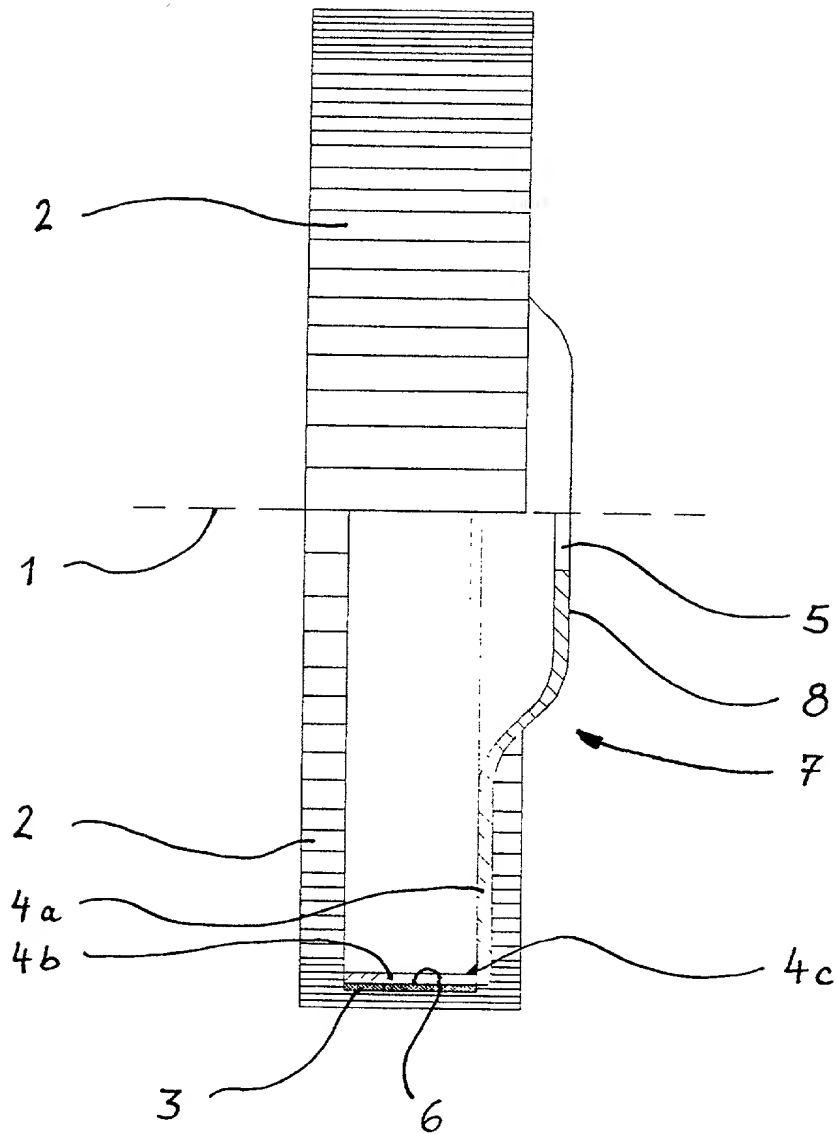


Fig. 1

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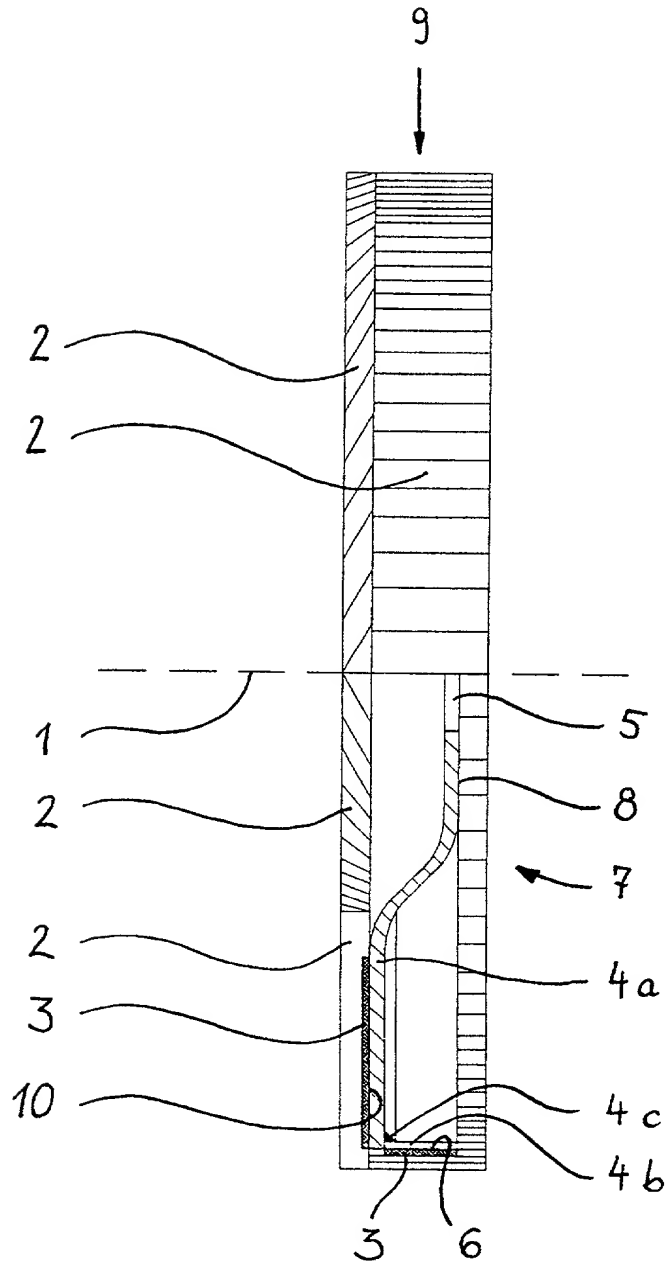


Fig. 2

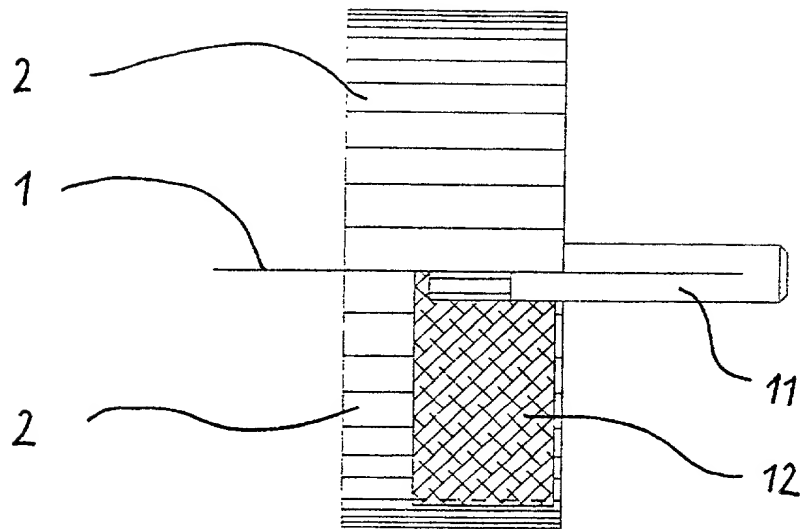


Fig. 3

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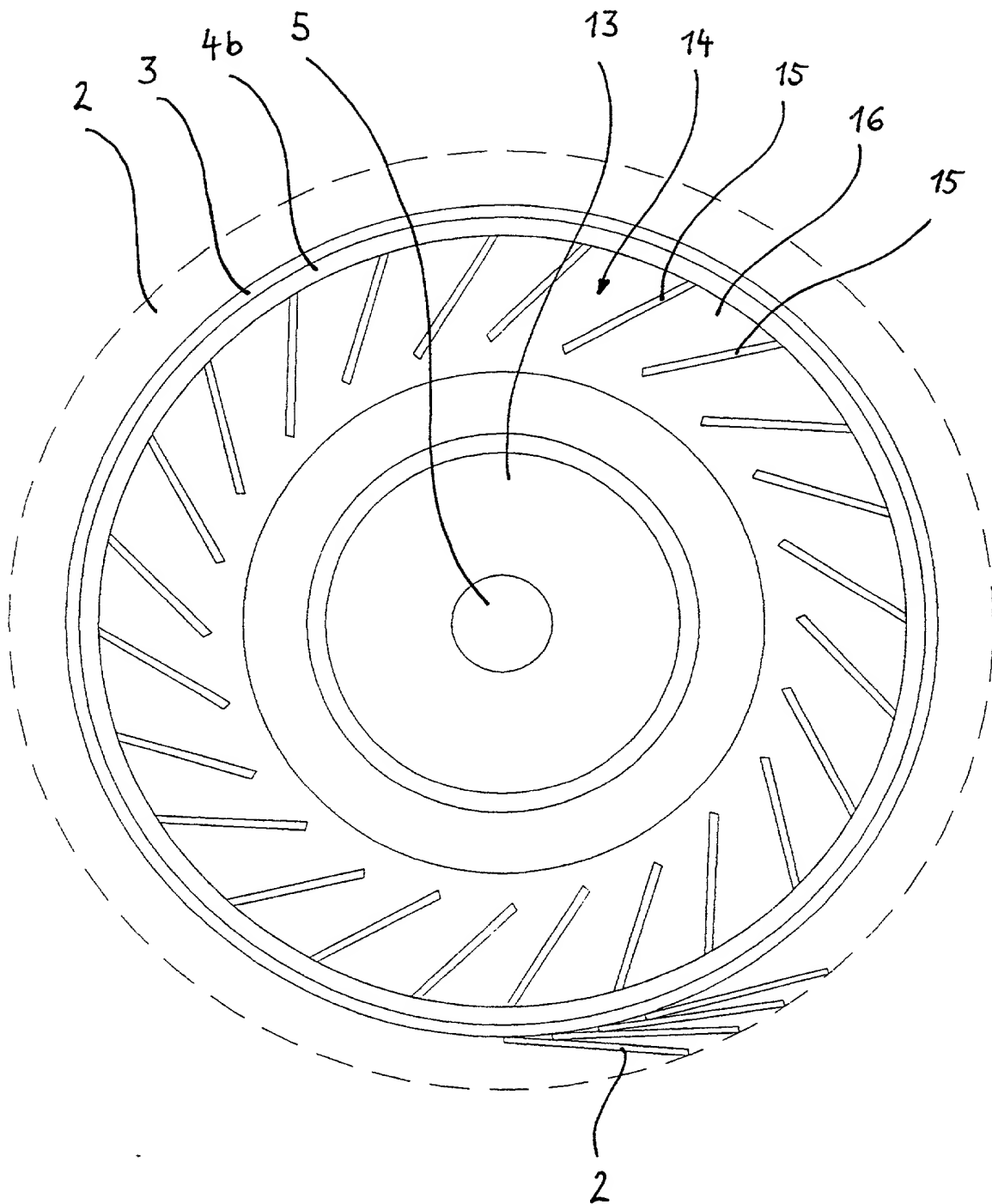


Fig. 4

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As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

PLATED GRINDING TOOL

the specification of which is attached hereto unless the following box is checked:

- ☒ was filed on 9/21/2000
as United States Application Number or PCT
International Application Number
Not Yet Assigned and was amended on
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I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

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21/03/98
(Day/Month/Year Filed)
(Tag/Monat/Jahr der Anmeldung)

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(Tag/Monat/Jahr der Anmeldung)

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